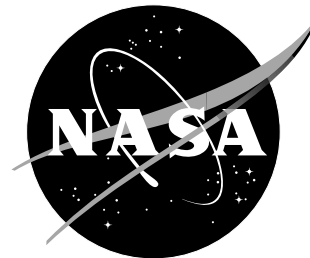


NewsRelease



National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23681-0001

Chris Rink
(757) 864-6786

For Release: May 13, 2002

Julia Cole
(757) 864-4052

RELEASE NO. 02-035

NASA Scientists Use Empty Skies to Study Climate Change

When the tragic events of September 2001 temporarily halted U.S. commercial air traffic, it created an opportunity to study the relationship between aviation and clouds.

From satellite observations taken during the air traffic shutdown, NASA scientists gained insight into the atmospheric conditions that govern the formation of contrails -- clouds caused by aircraft emissions.

"Because air traffic is expected to grow over the next 50 years, contrail coverage will also increase and may significantly impact the Earth's radiation budget by 2050," said Patrick Minnis, a senior research scientist at NASA's Langley Research Center in Hampton, Va.

The Earth's radiation budget -- the balance between the planet's incoming sunlight and outgoing heat energy -- drives climate change. Contrails can spread into extensive high, thin cirrus clouds that tend to warm the Earth because they reflect less sunlight back to space than the amount of heat they trap.

Tracking the formation of contrails is key to determining their contribution to cirrus clouds and their effect on the energy balance. But contrails typically form in large numbers from overlapping commercial flights, making it difficult for scientists to follow their development.

The air traffic shutdown gave Minnis and his team the chance to track individual, persistent contrails from military aircraft on September 12.

"Six aircraft were responsible for the formation of cirrus clouds that covered more than 20,000 square kilometers within an area between Virginia and central Pennsylvania," said Minnis. "During normal days, the area is crossed by thousands of jetliners that could each produce contrails similar to those from the military jets."

The results of the study provide the basis for improved prediction of persistent contrails and their effects on climate.

"If scientists determine that contrails are negatively impacting climate change, we could minimize their formation by predicting where they will occur and then suggesting alternate flight altitudes accordingly, when feasible," said Minnis.

-more-

“If scientists determine that contrails are negatively impacting climate change, we could minimize their formation by predicting where they will occur and then suggesting alternate flight altitudes accordingly, when feasible,” said Minnis.

Minnis will present “Spreading of Isolated Contrails During the 2001 Air Traffic Shutdown,” at the American Meteorological Society meeting in Portland, Ore., on Monday, May 13, 2002, at 1:15 p.m., during the Conference on Aviation, Range and Aerospace Meteorology: Session 2.1.

Two members of Minnis’ team will also present related research. David Duda of Hampton University in Hampton, Va., will present a contrail simulation study titled “A Study of Contrail Spreading Over the Great Lakes” on Tuesday, May 14, 2002, at 2:15 p.m. -- Session J1.2.

Duda’s research used improved estimates of relative humidity—the amount of water vapor in the atmosphere—from Minnis’ study to enhance computer simulations of contrails. He compared commercial airline flights over the Great Lakes with remote sensing satellite data to verify the accuracy of his contrail predictions.

Rabindra Palikonda of AS&M, Inc., in Hampton, Va., will present “Contrail Climatology over the USA from MODIS and AVHRR Data” on Tuesday, May 14, 2002, at 2:30 p.m. -- Session J1.3. Palikonda determined the coverage of linear contrails and their effect on the Earth’s energy balance over the United States during 2001 using satellite observations.

For more information, visit <http://www.larc.nasa.gov>.

- end -